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THE STRATEGIC
AND
COMMERCIAL EVILS
OF A
BREAK OF GAUGE IN INDIA,

WITH
PARTICULAR REFERENCE TO A BREAK OF GAUGE AND OF
AGENCY IN THE LINES OF THE PUNJAUB.

BY
W. P. ANDREW, Esq.,
CHAIRMAN OF THE SCINDE, PUNJAUB AND DELHI RAILWAY COMPANY.
*Author of "Indian Railways, by an Old Indian Postmaster," "Letter
to His Grace the Duke of Argyll on the completion of the Railway
System of the Valley of the Indus," &c., &c.*

WITH MAP AND APPENDICES.

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PALL MALL, S.W.

1874.

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28 July 30 1710

SOME EXPLANATION, if not an Apology, appears to be necessary for calling attention again to the great imperial question of a "Break of Gauge" in Indian railways.

It was thought the decisive and authoritative discussion at the Institution of Civil Engineers—the pledge given by the Prime Minister in deference to the opinion of the House of Commons as expressed on Mr. Laing's motion—the experience of the past as corroborated by every man of eminence in railway construction and management,—would have sufficed to have averted from India so great a calamity as the introduction of a break of gauge in the backbone of her railway system—a strategic, commercial and financial blunder of the first magnitude, but the attitude of the Government of India appears to demand renewed vigilance, for, as yet, they make no sign.

W. P. A.

General Sir Arthur Gordon

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CONTENTS.

Extract from a Despatch from the Viceroy, Lord Northbrook, to the Secretary of State for India in Council, the Marquis of Salisbury,	PAGE 5
Strategical and Commercial Evils of a Break of Gauge in India, with particular reference to a Break of Gauge, and of Agency, in the lines of the Punjaub	7

APPENDICES.

Scheme of Amalgamation of the several undertakings of the Scinde Railway Company—as submitted to the Proprietors	51
Papers relating to the Harbour of Kurrachee	54

N O T E .

WHILST these sheets have been passing through the press, a Despatch from the Viceroy in Council (Lord Northbrook) to the Secretary of State in Council (the Marquis of Salisbury) has been published of which the following, relating to the arrangements made for the relief of the Famine, is an Extract:—

“ We have arranged for a supply of about 465,000 tons, which will leave a reserve of about 127,000 tons. Of this about 385,500 tons will come from beyond sea. About 160,000 tons have already arrived, and ships are daily arriving as fast or even faster than the railways can convey the rice up country. We do not anticipate any difficulty in making further purchases should they be required. We have from the first been of opinion that the greatest difficulty would be experienced, not in obtaining supplies, but in the proper organisation of the land transport, and the detailed arrangements for rendering food available at the right places to those who might be in want of it. The number of people for whom it is possible to provide by grain imported from without is limited by the carrying power of the railways; and, again, the amount which can profitably be sent by rail to the famine-stricken districts is limited by the number of carts which can be procured and which, when procured, can be loaded and despatched daily from the railway stations. Although some grain, both on account of Government and private traders, reaches the distressed districts by water carriage, the chief reliance, both of Government and the trade, must be placed upon the railways. The East Indian Railway traverses Behar, and is throwing grain into that province both upwards from Calcutta and downwards from the North-Western Provinces and the Punjaub. The Eastern Bengal Railway takes

supplies up from Calcutta to Kooshtea and Goalundo, whence they are distributed in the Rajshahye Division by means of steamers, boats, and carts. The amount of Government grain already sent up the East Indian Railway is about 117,000 tons, and the amount sent up the Eastern Bengal Railway is about 33,000 tons. The East Indian Railway is now taking daily an average of 2,000 tons of Government grain and 400 tons of private grain up country, and the Eastern Bengal Railway is taking an average of 800 tons of Government grain up to Kooshtea and Goalundo. *At the same time the trade is sending large quantities of grain down from the North-Western Provinces and the Punjaub into the famine districts. We are informed that 23,580 tons of grain, or sufficient to load 118 trains, are awaiting despatch at stations on the Scinde, Punjaub and Delhi Railway. This accumulation is within the station premises only, and it is believed that the stocks lying in the bazaars adjoining the railway stations are more than equal (they are said to be four times as great) to the accumulations inside the station yards, while it is certain that the supplies in the country, independent of the present abundant crop, are scarcely yet affected by the heavy despatches that have been made to Bengal. The daily average amount of grain which is now being brought from the north and west into the famine districts is 1,700 tons, of which some portion is fodder for cattle. Your Lordship will, therefore, observe that, including what is being done by Government and what is being imported by grain dealers, grain to the amount of about 5,000 tons per diem, or sufficient to provide a daily ration for nearly 8,000,000 people, is converging on the famine districts. Under these circumstances, should it become necessary to make further purchases on Government account, we propose to draw upon the abundant markets of the Punjaub and the North-Western Provinces, which, in so far as Government is concerned, are as yet almost untouched."*

*The Strategical and Commercial Evils of a Break
of Gauge in India, with particular reference to a
Break of Gauge, and of Agency, in the lines of
the Punjaub.*

To those, who, like the writer, have devoted much time and thought to the improvement of our Indian communications, every year has shown how ill and tardily India is supplied with Railways, Canals, and common roads, and if further proof had been necessary to show our inability to grapple with any emergency, (depending on means of transport) either promptly or efficiently, it would have been found in the paralyzing influence these wants have exercised in meeting the requirements of the present most deplorable Famine in Bengal. The existing railways have certainly not been able to comply with the demands made upon them. The lines have been, and are, blocked with grain, and it has been

stated publicly more than once that if the wants of the Famine are to be met, the ordinary traffic of the country must, to some extent, be set aside.

Having these facts before our eyes, it appears almost incredible that the Government should not have more readily recognised the inexpediency of introducing any serious dislocation in the Trunk Lines in India, such as would arise from a Break of Gauge, yet nevertheless this great question is still an open one.

Before entering further on the question of the strategical and commercial evils of a Break of Gauge in India, it is necessary to recall to recollection the fact that the gauge of the Indian Railways, which was settled so far back as 1850-51, was not decided on in haste, and that the existing Standard Gauge of 5 feet 6 inches was fixed under the administration of Lord Dalhousie, when the question received a statesmanlike consideration at his hands.

Lord Dalhousie spoke from practical knowledge, and he warned the Home Authorities before hand against the evils which must follow any subsequent change of gauge.

In a Minute written by his Lordship as Governor General of India, and dated 4th July, 1850, he said:—

“32. The Court of Directors have recommended

at the same time the use of the narrow gauge of 4 feet $8\frac{1}{2}$ inches" (standard English gauge) "for the Railway about to be constructed. Although the letter of the Court recommends but leaves to the Government of India to determine as to the gauge which should be adopted on this occasion, I consider the question to be one of such moment as to deserve a careful consideration and an authoritative and conclusive decision by the highest authority connected with the Indian Empire, who alone can have access to that full information and extended experience which would make such a decision really and satisfactorily conclusive."

"33. The British Legislature fell unconsciously and perhaps unavoidably into the mischievous error of permitting the introduction of two gauges into the United Kingdom. The numerous and grievous evils which arose from that permission are well known, and will long be felt throughout all England.

"The Government of India has it in its power, and no doubt will carefully provide, that, however widely the railway system may be extended in this Empire in the time to come, these great evils shall be averted,

and that uniformity of gauge shall be rigidly enforced from the first. But I conceive that the Government should do more than this, and that now, at the very outset of railway works, it should not only determine that an uniform gauge shall be established in India, but that such uniform gauge shall be the one which science and experience may unite in selecting as the best."

"34. At one time this question was much before me, and although I should not myself attempt to offer an opinion on so vexed a question, yet I may venture to form one on the recorded views of men competent in every way to judge.

"The evidence which was given before the Gauge Commissioners in 1846, and the evidence which has been given from time to time before the Committees of Parliament, backed as it has been by very high authority abroad, is, I venture to think, sufficient to show that the narrow gauge of 4 feet 8½ inches (a measurement adopted originally at hap-hazard, and from the accident of local circumstances) is not the best gauge for the general purposes of a railway, and that something intermediate between the narrow

gauge of 4 feet $8\frac{1}{2}$ inches and the broad gauge of 7 feet will give greater advantages than belong to the former, and will substantially command all the benefits which are secured by the latter."

- " 35. The circumstances which have been brought forward by Mr. Simms in his report, applicable especially to this country, strengthen the reluctance which I feel to introduce the 4 feet $8\frac{1}{2}$ inch gauge into India, without a very deliberate reconsideration of the question, with reference to India, under the direction of the Honourable Court by the Board of the East Indian Railway Company. I should not have felt satisfied that I had done my duty if I had not brought this question pointedly under the consideration of the Court, requesting them formally and finally to determine whether a wider gauge than the 4 feet $8\frac{1}{2}$ inches ought not to be established in India, and whether the gauge of 6 feet, which was recommended by engineers of eminence in England, and which was preferred also, if I recollect rightly, by M. de Pambour, should not be introduced on the experimental line in Bengal, and at the same time on the line which is in course of construction at Bombay."

Extract Financial Despatch from the Court of Directors of the East India Company to the Government of India, No. 45, dated 20th August, 1851.

“Paragraph 7. With respect to the question of gauge to which you have again adverted, our decision in favour of the 5 ft. 6 in. gauge was arrived at after a very careful consideration of the subject, and with the best opinions which we could obtain. That decision having been communicated to the Railway Companies, who have entered into contracts for the execution of works and for the provision of materials on the presumption that it is final it would lead to much inconvenience and expense if any alteration were now permitted.”

How well founded the views expressed by Lord Dalhousie in respect of a break of gauge were, it is unnecessary to say. Written a quarter of a century ago, every year has but tended to prove their absolute foundation in fact, and it is scarcely conceivable, therefore, that in the face of daily and accumulating experience, and of the enormous outlay made by the Great Western Railway during the last year or

two (and which is still going on) the proposition should have been seriously entertained to introduce these evils *on the Main Lines of communication in India*, where 5000 miles of railway have been constructed on the standard gauge.

Narrow gauge lines, or tramways, as feeders are a different matter, and it is not denied might advantageously be used in certain districts. Indeed the writer has advocated light railways or tramways for many years as subordinate to the main lines.

The proposed introduction of the Narrow Gauge into the main lines of India has now been before the public for about four years, and the expediency of the measure has been the subject of one of the most important and prolonged discussions that has ever taken place at the Institution of Civil Engineers—of a long and able debate in Parliament, and has received at the hands of the Press in England and India such consideration as is only accorded to questions of the highest importance.

At the Institution of Civil Engineers, the question was exhaustively dealt with* both in its strategical and commercial aspects, in February and March 1873 (the discussion extending over seven

* Paper read on “The Gauge for the State Railways of India, and particularly for those of the Punjab.” By WILLIAM THOMAS THORNTON, Esq., C.B. Secretary P.W.D. India Office.

evenings), and the measure was strongly condemned not only by experienced railway engineers and managers, but by such a concurrence of testimony, that it may certainly be claimed as the universal opinion of the railway public. It is impossible in this place to do more than give the names of the speakers who were

Against the Change of Gauge.

Mr. T. Hawksley . . President of the Institution.

PAST PRESIDENTS.

Mr. G. P. Bidder . . Consulting Engineer to the Scinde, Punjaub, and Delhi Railways.

Sir John Hawkshaw . F.R.S. Consulting Engineer to the Madras and Eastern Bengal Railways.

Mr. C. B. Vignoles . F.R.S.

MEMBERS OF COUNCIL OF THE INSTITUTION.

Mr. Geo. Berkley . . Consulting Engineer to the Great Indian Peninsula Railway.

Mr. G. B. Bruce . . Consulting Engineer to the Great Southern of India Railway ; and formerly Engineer in Chief of the Madras Railway.

Mr. J. Brunlees.

*Mr. T. E. Harrison**

Mr. Edward Woods.

Colonel J. P. Kennedy . Consulting Engineer to the Bombay, Baroda and Central India Railway.

Mr. George Turnbull . Formerly Engineer in Chief of the East Indian Railway.

Mr. Lee Smith . . . Late Chief Engineer, Punjaub Northern (State) Railway.

Mr. W. Pole, F.R.S. . Engineer to the Imperial Railways of Japan.

Mr. W. B. Lewis . . One of the Consulting Engineers to the Victorian Government.

Mr. J. T. Wood . . . Eastern Bengal Railway.

* Mr. Harrison is now President of the Institution of Civil Engineers.

FORMER GOVERNMENT INSPECTORS OF RAILWAYS.

Captain Douglas Galton C.B., R.E., F.R.S.

General Sir L. Simmons R.E.

Colonel Sir Frederick Smith R.E. .

PRESENT GOVERNMENT INSPECTORS OF RAILWAYS.

Captain H. W. Tyler . R.E.

Colonel Yollond . . . R.E.

CIVIL ENGINEERS.

Mr. W. Dennis.

Mr. C. Douglas Fox.

Mr. G. G. Heppel.

Mr. J. Mitchell.

Mr. A. S. Ormsby.

Mr. C. P. Sandberg.

Mr. Price Williams.

Sir G. B. Airy, Pres. R.S. Astronomer Royal.

Mr. W. P. Andrew . . Chairman of the Scinde,
Punjaub and Delhi
Railways.

Mr. J. J. Allport . . Manager of the Midland
Railway.

Mr. J. Grierson . . . Manager of the Great
Western Railway.

In addition to these authorities may be mentioned others, who though not taking part in the discussion, have expressed strong opinions against the change of gauge ; as,

- Mr. C. H. Gregory* . . . Past President of the Institution, who has reported officially against narrow gauge lines in the Colonies.
- Mr. G. L. Molesworth* . . . Now Chief Resident Engineer of the State Railways in India, who has also reported against narrow gauge railways in Ceylon ; and
- Mr. John Fowler* . . . Past President of the Institution, who reported to the Indian Government strongly against the proposed change in the Punjaub lines.

In support of the Change of Gauge.

Mr. W. T. Thornton, C.B. India Office. Author of
the Paper under dis-
cussion.

Lord Lawrence.

Mr. Juland Danvers . (Government Director of
the Indian Railway
Companies.)

General Strachey, R.E. . (Inspecting Officer of
Machinery and Stores
for the Indian State
Railway.)

Mr. A. M. Rendel . . Consulting Engineer to
the East Indian Rail-
way, and Executive
Engineer in England
for the Indian State
Railways.

Mr. G. C. Spooner . . Engineer to the Festi-
niog Railway.

M. Carl Pihl . . . Engineer of narrow gauge
lines in Norway.

Mr. E. W. Young.

Mr. G. Allan.

Mr. J. W. Grover.

} CIVIL ENGINEERS.

Whilst the discussion at the Institution of Civil Engineers was proceeding, the debate already referred to took place in the House of Commons, viz., on the 7th March, 1873, on a motion by Mr. Samuel Laing :—

“That it is contrary to Imperial policy to allow a break of gauge in the railway communications between the important frontier town of Peshawur and the main railway system of India.”

Mr. Laing is not only acquainted with India, but in experience of the working of railways he has few rivals, and this enabled him to deal with the matter in its most practical sense, both strategically and commercially.

It is difficult to describe the absolute position more concisely than did Mr. Laing in a speech as remarkable for its brevity as for its statesmanlike views in regard to our empire in the East.

“He said, it was his object to prevent a misfortune of national magnitude, a break of gauge in the Indian railway system at a point which was most important in a military point of view, and which might be regarded, in fact, as isolating Peshawur, the Metz of India. The main railway system of British India comprised 5,000 miles actually opened, inaugurated by Lord Dalhousie, and con-

structed on the wide gauge of 5 feet 6 inches, by separate Companies, under what was known as the guarantee system, at a total cost of £90,000,000, or between £16,000 and £17,000 per mile. The cost, though large, was not excessive, if difficulties arising from the inherent condition of the country—from the numerous rivers and torrents which had to be crossed*—were taken into account. The general traffic up to the present time showed that under the guarantee of 5 per cent. there was a loss on the £90,000,000 of £1,600,000 a-year, or about $1\frac{1}{2}$ per cent. That loss was, however, expected to disappear as the means of communication with the different stations opened up—such as branches, tramways, and above all, good common roads—the last named being essential for the conveyance of produce.

“Though the loss of $1\frac{1}{2}$ per cent. on the capital entailed a considerable burden on the Empire, it would be taking only a narrow view of the subject if he were to say that the construction of these railways was not an enormous advantage to India. The progress of the Empire since their construction had been most extraordinary in its rapidity. In

* The inland carriage of permanent way material, engines and rolling stock was, also, for many years, exceedingly expensive, as no facilities for transport existed; but this source of expense is lessening yearly. —W. P. A.

the period of about 15 years the Revenue had risen from £30,000,000 to £50,000,000 sterling a-year, and the aggregate imports and exports showed an increase during the same time from £50,000,000 to £100,000,000 sterling. Nobody would deny for a moment that a great portion of that progress was to be attributed to the introduction and extension of railways. During his Viceroyalty Lord Mayo, one of the most able and popular of the many great Governor-Generals of India, became impressed with the great advantages conferred by these railways, and arrived at the conclusion that 10,000 additional miles of railway were urgently needed to supplement the first and main-trunk system of which 5,000 miles had then been completed. For the execution of such a work, economy of construction being obviously necessary, the Government of India had with that view adopted what was called the *metre* gauge, of 3 feet 3 inches for the lines of the new system, by which it was estimated that £1,000 per mile would be saved on their cost. The superior economy of the proposed break of gauge—though advocated by two distinguished officers of Public Works in India—was disputed by the common consent of all great railway engineers and practical managers. Mr. Hawkshaw, one of the most eminent engineers in the world, had predicted

that the Indian Government would have to spend more money in remedying the evil of a break of gauge, than they would save by introducing it. That prophecy was confirmed by the experience of all countries into which a break of gauge had been introduced, and especially by what had happened to our own Great Western Railway. He would not, however, go into the general question, his Resolution being confined to the particular case of the line to Peshawur, which was not of local, or even of Indian importance only, but of Imperial interest. They had a continuous line of some 3,000 miles constructed on the 5 feet 6 inches gauge from the principal capitals and centres of India, leading up to Lahore where it terminated, while between Lahore and Kurrachee, the nearest point of shipment for England, and where in any emergency, stores and troops would arrive most speedily from this country, the line was constructed already in great part on the wide-gauge principle. The question was really confined to whether the line from Lahore to Peshawur, which was about 280 miles in continuation of the 3,000 already constructed, should be constructed on the same gauge, and also the central section of the Indus Valley line between Mooltan and Kurrachee. The hon. Member proceeded to show that from the anticipated saving of

£1,000 per mile by the adoption of the metre gauge they must deduct the cost of the necessary alteration of gauge on the lines already made, and also the cost of the extra rolling stock which would be required for the isolated portion of the system. According to the estimates of the Indian engineers* the saving which would be effected by the adoption of the narrow gauge was £532,823, while, according to Mr. Fowler, an engineer not unfavourable to the narrow gauge under certain circumstances—and who, of all others, was most competent to speak on the question—it was only £30,000. Taking even the larger sum, it was not worth while for such a saving to have a break of gauge on a line of great political importance. There was not a man of the slightest experience in railway matters who would listen to such a proposition for a moment. This was the main line of communication between the Punjaub and the rest of India and with the Port of Kurrachee,† and on a line of this importance they were about to place the barrier of a break of gauge. The population directly or indirectly interested in

* On reference to page 35, it will be seen that the Government of Lord Mayo only estimated the saving on the Indus Valley line (taken at 500 miles) at £200,000.

† See Appendix B, Papers regarding the Harbour of Kurrachee.

this railway amounted to 20,000,000. This was not a sparse population scattered over an infertile territory. The cultivated area of the Punjaub was alone 12,000,000 of acres, and there were 6,000,000 of acres not yet cultivated, which, under the settled rule of England, were rapidly being brought under tillage. The surplus produce of this territory was reckoned at 777,481 tons, the great bulk of which was of a nature that was ill adapted to stand the loss and expense resulting from a break of gauge. This railway also formed the line of communication for the growing trade of Afghanistan and the whole of Central Asia. They heard a good deal about Russian commerce competing with them in Central Asia, and could anything be more foolish than to interpose a break of gauge on the line by which the produce of British manufactures reached Central Asia to compete with the produce of Russia? Putting, however, aside the commercial interest, he would come to the military and political question, and ask if, for the saving which he had mentioned, it was worth while to interpose the obstacle of a break of gauge in a military and political line of first-rate importance? A break of gauge meant a great deal more than mere delay. It meant that the engines, carriages, and rolling stock on the other 6,000 miles of railway were not available beyond

Lahore, and that in case of emergency 1,200 engines and 36,000 carriages, forming the stock of the main railway system of India, could not be employed on the 1,092 miles of the narrow-gauge line. The proposed complement of the latter, moreover, consisted only of 84 engines and 2,520 carriages, though if it had the same complement as the broad-gauge, the estimated saving would be converted into a balance on the other side. Reinforcements of troops and *matériel* would thus be dependent on this amount of rolling stock.* What were the peculiar special circumstances of Peshawur? He had never been one of those who had regarded the progress of Russia in Central Asia with particular apprehension. He believed that no collision was likely to take place between the two great Empires in that quarter; but, at the same time, the best way to avert that calamity, or even the lesser calamity of a misunderstanding between the two countries, was that each should feel as secure as possible on her own territory. Experience had shown that

* Mr. Bidder has stated from his experience as a Member of the Railway Volunteer Staff Corps, that not only would the narrow gauge line be unable quickly and efficiently to convey troops and military stores, but that it could not carry horses and modern artillery at all. This opinion was put forward publicly some three years ago, but even the most ardent supporters of the narrow gauge have not ventured a reply.—W. P. A.

there was no more fertile source of misunderstanding than when a nation felt that it was weak and was jealous about what its neighbours were doing. In the event, however, of a serious campaign in Central Asia, the great object of England would be to reach Herat first, and it was manifest that to do that, the primary consideration was the possibility of concentrating rapidly at Peshawur every available man, horse, and gun. They ought to recollect also that in moving forces in India they had not simply to move them, but that the impediments of an Indian Army were necessarily cumbrous. Authority and experience both showed that an essential condition of success in the moving of masses of troops by railway was that there should be unbroken communication from end to end of the line, together with an abundance of material and rolling stock. This fact was demonstrated by Mr. Bidder, Mr. Hawkshaw, Mr. Maclean, and other engineers of eminence, who pointed out that on a great military line even the risk of disaster could not be expressed in money, and that a break of gauge might be the cause of actual disaster.

“At a meeting of the Institute of Civil Engineers, the Astronomer Royal, as a member of the old Railway Commission, denounced the evils likely to arise from the break of gauge. They had, too, the

authority to the same effect of gentlemen who combined knowledge of railway working with military experience—he alluded to the Inspectors of the Board of Trade. Captain Galton, an eminent officer of the Royal Engineers, who had been connected with the Society for the aid of the Sick and Wounded during the late war, described the advantage the Germans derived from unbroken gauge, and added that in the case of a break of gauge the confusion in the forwarding of troops would be absolutely indescribable. Captain Tyler, another distinguished officer of the Royal Engineers, said that the difficulty in the forwarding of troops by railway was not the running of the trains, but the getting of the soldiers into the carriages, and that in the case of a break of gauge that difficulty would have to be encountered twice over, and he went on to say that a break of gauge would do away with the advantages in a military point of view which they had been led to look forward to from the construction of railways in India. Then, again, they had the high authority of Lord Lawrence, Sir Bartle Frere, and General Sir Henry Durand, as to the necessity, in a military point of view, and also politically as well as commercially, of having an unbroken gauge from end to end of the great and important line to which

he referred. He could easily multiply authorities on the point,* but the question was one not only of authority, but of experience. The value of railways in time of war was amply shown during the late war. If one thing more than another contributed to the astounding success of the Germans it was the fact that they were able to do that which we were about to preclude ourselves from doing in India—namely, to bring up their troops and supplies from the centre of their forces and reserves to the scene of operations. From Berlin to the Rhine their lines had an unbroken gauge.

“There was a break of gauge at Metz, and in order to surmount it the Germans constructed a circular railway. Again, a tunnel 30 miles to the east of Paris was blown up, and all the accounts of the war showed that the difficulty of moving stores and supplies over that one mile thus interrupted was as great as to bring them the 1,000 miles from Berlin to Paris. On the other hand, the want of adequate railway communication was the cause of

* The views expressed by these distinguished statesmen will be found in a letter addressed to his Grace the Duke of Argyll, K.T., &c., &c., by the author (published by W. H. ALLEN & Co., Waterloo Place) “on the completion of the Railway system of the Valley of the Indus,” together with the opinions of other great authorities, including Sir Charles E. Trevelyan, Sir Henry Green, and the Hon. H. S. Maine.

signal failures on the part of the French. From an official account of Bourbaki's disastrous expedition to the East of France, he learnt that eight days were occupied in forwarding the 18th and 20th Corps d'Armee by two lines a distance of 150 miles; and that it took 12 days to move the 15th Corps a distance which the Minister of War had calculated could be accomplished in 48 hours, a delay which arose mainly from a deficiency of rolling stock. Some of the men were three days in the carriages with the thermometer at 15 degrees of cold. If they substituted 120 degrees of heat for 15 degrees of cold, they would have an example of what would occur if they attempted to mass a large number of troops at Peshawur.* Such disastrous delay and

* The credit of organising a military railway system in Germany is entirely due to the talents of that able strategist General von Moltke, who with admirable forethought, amounting almost to the gift of prophecy, paid great attention to the subject in time of peace, and hailed with joy every scientific improvement in railways as an additional facility for the conveyance of armies and their war materials. As far back as the year 1861, when the railway map of Germany was very imperfect and showed great gaps or breaks of continuity, he reduced to writing his ideas on the subject, and issued a code of instructions for the military railway service, based on his experience of the mobilisation of a part of the Prussian army as a corps of observation during the war in Italy between France and Austria in 1859. But it was not till after the war of 1866, and with the experience gained by it, as well as the further very considerable augmentation of the

confusion they ought by every means in their power to endeavour to avoid in the case of India. He had studiously limited the terms of his Motion so as to include only what he believed to be a question of Imperial policy. It related, moreover, to a subject on which they could act as he suggested without implying any slight or censure upon anyone. He trusted that they might avoid a division by receiving an assurance from the Government that the Indian Government would be recommended to reconsider the subject. Further than that, of course, he did not ask the right hon. gentleman to go. If this were done, he believed the result would be that there would be opened a door of escape to all parties from what he felt satisfied was a very false position."

In replying on behalf of the Government Mr. Grant Duff simply reiterated the arguments placed before the Institution of Civil Engineers by Mr. Thornton

railway map in consequence of the numerous new lines that had in the meantime sprung up, that he had perfected his system, and was enabled to publish a new edition of his "Instructions for the Army," with numerous explanatory schedules, tables, diagrams, and other illustrations, which was printed in 1867, the year after the war, at Decker's Court Printing Office at Berlin, copies being distributed to all commanding officers and railway companies.—Extract *Railway News*, 24th September, 1870.

quoting largely from his paper, and it has already been shown that in the discussion that arose on that paper the introduction of a break of gauge was unanimously condemned by the highest authorities of the day.

The result of this all-important Debate—the whole bearing of which was in favour of maintaining the standard gauge—was that the Prime Minister pledged himself that the discussion should be commended to the consideration of the Government of India, and Mr. Laing refrained from pressing his motion on this understanding, remarking that he thought the “best discretion would be exercised by being contented with the strong expression of opinion elicited in the course of the Debate, and refraining from pressing his motion to a division.”

The discussion was, in accordance with the pledge given by the Prime Minister, forwarded to the Viceroy, and it is generally understood that Lord Northbrook has expressed himself against a break of gauge, and that he favours the maintenance of the standard gauge for all main lines.

It seems necessary at this point to call attention to the fact that it has been put forward by many advocates and promoters of the narrow gauge, and by Mr. Grant Duff in the House of Commons that the departure from the standard gauge—or as it

has been expressed—"the alteration of the Indian gauge" was the distinctive act and personal policy of the late lamented Lord Mayo ; but this appears to be an erroneous view. Lord Mayo's policy was founded on economy, and not on a change of gauge, and certainly not on a break of gauge, but simply the most economical means of supplying India with its further extension of railways ; estimated at the time at 10,000 miles.*

The Writer does not hesitate to say that a careful perusal of the voluminous correspondence published in regard to the extension of railways in India and presented to Parliament will show that

* In the paper read by Mr. Thornton, C.B., before the Institution of Civil Engineers his argument was almost entirely based on the saving to be effected on 10,000 miles of line, and this datum was adopted by speakers in the discussion—and he stated in his reply in relation to some remarks by Mr. George Berkley that "he could assure Mr. Berkley he could show him projected lines which, taken together, would make up 10,000 miles."

But on a final correction of the proofs in May, 1873, Mr Thornton appended the following foot note to this :—

"I am sorry to find myself, on further enquiry, obliged to admit that this was a considerable over-statement. The Indian Government did certainly, in March 1869, represent to the Secretary of State that about 10,000 miles were then wanting, in addition to the 5,000 miles already constructed, or in process of construction, to provide India with a complete network of railways, but of those 10,000 miles not more than 3,000 have as yet been actually marked out.—W.T.T."

the Government of Lord Mayo were very reluctant to introduce a break of gauge on the Punjaub lines unless an absolute and appreciable money saving could be effected.

One or two instances may be given. In a despatch, No. 51 Railway, dated 17th May, 1870, Lord Mayo wrote as follows :

“9. Firmly convinced of the sufficiency of a narrow gauge to carry the traffic of our *secondary lines*, and fully satisfied that an important economy must ensue in the aggregate over the whole extension system, we should fail in our duty to India if we hesitated to advocate the adoption of a gauge narrower than the present standard. Whether that gauge should be 3 feet or 3 feet 6 inches, is, comparatively a matter of detail. As at present informed, we should regard 3 feet 6 inches as the maximum width that should be adopted. An early decision on the point is called for, so as to admit of timely arrangements being made for rolling stock, and we should be glad if your Grace would determine it, after communication with the best authorities on the subject.

“10. Your Grace will not have failed to observe that thus far we have kept the question of narrow gauge lines distinct from that of light and slow lines. Obviously, they are distinct questions, and it would

not be difficult to find a case in which it might be proper to avoid a break of gauge, and at the same time to ensure a large economy by the use of light rails capable of bearing the vehicle, but not the locomotive stock of the trunk lines, combined with a slow speed. The advantage of being able to avail ourselves on such a line of the reserve of the vehicle stock of the entire trunk system, to meet a sudden emergency or an exceptional traffic, is indubitable, and to take a particular case, such as that of the Lahore and Peshawur line, would be so paramount as to forbid the adoption of a narrow gauge, unless in connection with a much longer length of line on the same gauge, the stock of which could, on occasion, be concentrated, or in combination with a large reserve of stock which, till the emergency occurred, would be useless, and would represent a large unremunerative capital."

Again, in a further despatch, No. 52 Railway of the same date:—

"3. We have no hesitation in saying that, were it a question of the section between Lahore and Peshawur alone, we should at once dismiss from consideration all idea of anything but a standard gauge line. The ordinary traffic on this route, with the exception of salt from the Pind Dadun Khan mines, is so small that any railway of the

smallest gauge or lightest rails would carry it. Commercially, the line has little to recommend it. Politically, it is of the highest importance, and in consequence may, on emergency, be exposed to the demands of a heavy extraordinary traffic. To adopt a different gauge than from the lines terminating in Lahore would involve the necessity of maintaining a large stock in inactivity, so as to be prepared for the emergency. This would be a constant source of outgoing, in addition to the loss of interest on the capital sunk.

“4. The question has, however, presented itself whether, as the gap between Mooltan and Kotree of 500 miles has yet to be constructed, the necessary reserve of stock might not be secured by adopting a narrow gauge for that line. It is true that the country is such that the saving by the adoption of a narrow gauge line would not, as respects the reduction that may be feasible in the works, be so great as in other parts of the plains of India, but there can be no doubt that in a sparsely populated country like Sindh every possible reduction in the amount of work to be executed should be taken advantage of. There would, however, be a saving which, over 500 miles, may amount, it is roughly estimated to £200,000, apart from any further saving which may be possible in stocking the line

or by using a light description of permanent way. The adoption of a narrow gauge on this gap would, however, necessarily involve the relaying of the Sindh and, as far as Lahore, of the Punjaub line on the same gauge. These lines are at present laid with rails of from 65lbs. to 68lbs. per yard, chiefly on timber sleepers, about 70 miles of the Punjaub line being on iron bowls. The rails are heavier than would be required for the improved stock of the narrower gauge, but together with the stock at present working over them can be utilised elsewhere. The consent of the Railway Company would, of course, be necessary, but looking to the probable diminution of their capital account that would result from the relaying of these lines with lighter rails, and to the obvious advantage of uniformity of gauge throughout the Indus Valley, we apprehend that a proposal to this end would not prove unwelcome."

It is believed that the discussions which have taken place, and which have been of the widest scope, have conclusively shown that so far as the Indus Valley and Peshawur lines are concerned, even a present tangible money saving, is quite illusory, and it may be affirmed therefore that on the ground of immediate outlay alone the construction of these lines on the normal gauge would

be entirely in accordance with Lord Mayo's policy.

It is well known that the Commander-in-Chief, Lord Napier of Magdala, a distinguished strategist and engineer, has expressed himself strongly in favour of continuing the standard gauge from Kotree to Peshawur, and that he urged in a Minute written so far back as 7th July, 1870, the necessity of the immediate completion of the Punjaub system.

Reference has now to be made to the double complication which will arise, in the event of a break of Agency as well as a break of gauge occurring in the Punjaub.

The Scinde, Punjaub and Delhi Railway Company not only projected the Indus Valley line as part of their system, but made the whole of the preliminary surveys, a staff of 15 engineers and surveyors, under a chief engineer, having been sent from this country in November, 1863, more than ten years ago, under the sanction of Sir Charles Wood (Lord Halifax) when Secretary of State for India in Council, for this special purpose.

These surveys were energetically and carefully made, and the Company did not doubt but that

ultimately they would be allowed to complete so vital a part of their system.

The Scinde, Punjaub and Delhi Railway Company is an amalgamation of four distinct undertakings, viz., the

Scinde Railway,—Kurrachee to Kotree.

Indus Steam Flotilla—Kotree to Mooltan.

Punjaub Railway—Mooltan to Lahore.

Delhi Railway—Lahore to Delhi.

which were projected for the purpose of opening up railway communication between the sea-board at Kurrachee, the Punjaub, and the important districts around the City of Delhi, and also that complete access might be had to Peshawur from Kurrachee, the nearest European port in India.

The steamboat service of the Flotilla, although of great value at the outset, in facilitating the construction of the railways, and in assisting to encourage the trade of the country, was always regarded as a temporary expedient, to be superseded by a railway up the Valley of the Indus.

The late Major General Sir Henry Durand, R.E., when Member of the Supreme Council of India, in an Official Minute on the subject, said—

“The importance of bringing the Punjaub and the whole line of the Indus frontier into easy communication with the sea-board seems commercially, politically, and militarily, of extreme moment. I think the line of railway should be on the left bank of the Indus.

* * * *

I regard a line of railway from Lahore to Attock, on the left bank of the Indus, as part and parcel of our Indus frontier railway system, and should certainly consider it as only second in importance to the Mooltan and Kotree line. To my mind it is an integral and necessary part of the Punjaub railway system, which would be seriously incomplete without it. *The whole of these Indus frontier railways should, if possible, be under one management and one Company.*”

The harbour of Kurrachee is now, owing to the improvements already referred to, second to none in India.

Writing to the Government of Bombay on the 15th September last, the Commissioner in Scinde, Colonel Sir W. L. Merewether, K.C.S.I., C.B., said,

“Vessels of the largest class may now enter

and leave the port with perfect ease and safety during the fair season * * * *
 Vessels not exceeding 21 feet of draught can enter or leave the port without difficulty or delay during all seasons of the year. And during the fair season, from October to 15th May, vessels of the largest class, with draught of 24 feet can do the same. If, therefore, it is at any time desired to embark or disembark troops at Kurrachee for England, Scinde, the Punjaub, or North-West Provinces, no reason any longer exists why H. M. troop ships should not visit this port, and so save the double shipment, which has hitherto been the objection to this line being adopted."

The following correspondence took place between the Writer, as Chairman of the Scinde, Punjaub and Delhi Railway Company, and the Secretary of State for India in Council, at the time the amalgamation was in course of being carried out and coincident with the publication of the Government scheme for extending the railways of India through State agency.

“ LONDON,

“ 23rd June, 1869.

“ No. 3284.

“ *The Under Secretary of State for India.*

“ SIR,

“ With reference to previous correspondence on the subject of the Indus Valley Railway, proposed by this Company with the view of completing their trunk line of railway between Delhi and Kurrachee, I have the honor to request that you will do me the favor to inform me whether any decision has yet been come to by the Secretary of State for India in Council in reference to the grant of a concession for the line.

“ The Annual General Meeting of the Proprietors of this Company will be held on Tuesday, the 29th inst., and as it is highly probable that the questions put to me at the recent Extraordinary General Meeting in connection with the proposed amalgamation of the Company's undertakings will be renewed upon that occasion, it is very desirable that I should be in a position to afford to the Proprietors some reliable information on a subject which they consider to be of the most vital importance, as

testified in the Resolutions passed by them on more than one occasion, and more especially at the recent Extraordinary Meeting, when the question of proceeding with the Amalgamation* Bill, now before Parliament, was submitted for their consideration.

“ I am, SIR,

“ &c. &c.,

(Signed) W. P. ANDREW,

“ *Chairman.*”

“ INDIA OFFICE, S.W.,

“ *1st July, 1869.*

“ SIR,

“ I am directed by the Duke of Argyll to acknowledge receipt of your letter of the 23rd ultimo, No. 3284, enquiring whether any decision has been come to regarding the construction of a railway through the Indus Valley, for connecting the Scinde and Punjaub Lines.

“ In reply, I am directed to state that the subject is still under consideration.

“ I am, SIR,

“ &c. &c.,

(Signed) “ J. COSMO MELVILL.

“ W. P. ANDREW, Esq.”

* The original terms under which the Proprietors assented to the amalgamation will be found in Appendix A.

No. 3312.

“ LONDON,

“ 8th July, 1869.

“ *The Under Secretary of State for India.*

“ SIR,

“ I have the honor to acknowledge the receipt of Mr. Melvill's letter of the 1st inst., stating, in reply to my letter of the 23rd ult. (No. 3284), that the question of constructing a railway through the Indus Valley, to connect the Scinde and Punjaub lines, is still under consideration. The subject being under consideration, the present appears a fitting opportunity for laying before the Secretary of State for India in Council the views of the Directors regarding it, and for reminding him of the claims of the Scinde Railway Company for the concession for its construction. The Indus Valley Railway forms a necessary and integral part of the trunk line between Kurrachee and Delhi, of which both extremities are in the hands of this Company. The intervening portion of the route, moreover, (from Kotree to Mooltan), has also been placed in the hands of this Company, who at present conduct the traffic by means of the Indus Steam Flotilla, and the very necessity for completing the railway has in fact arisen out of the inadequacy of the Flotilla to maintain an efficient connection between the

upper and lower portions of the Company's line.* This Company, who, it is to be observed, originally proposed the line, have already, with the sanction of the Secretary of State for India, and at considerable expense, taken surveys of the country through which it would pass; and they have the various plans and sections in their possession. They have in their service a chief engineer of great skill and experience, who enjoys the confidence alike of the Directors and of the Government, and who might well be entrusted with the execution of the undertaking. Mr. Harrison, the engineer in question, is moreover supported by an efficient staff, the members of which have acquired considerable experience, some of them having taken part in the survey of the Indus Valley line itself, and whose services will be lost to the Company after the completion of the Delhi Railway, unless it should in the meanwhile be decided to proceed with the construction of the Indus Valley line. I would here draw attention to an extract from a dispatch from the Government of the Punjaub to the Government of India, under

* As a recent illustration, it may be mentioned that owing to the pressure of traffic caused by the carriage of grain, &c., the Agent reported to the Board on the 15th January, 1874, that "through booking via the Flotilla had been suspended till the accumulation of goods at Shere Shah, the lower terminus of the Punjaub Railway, had been reduced."

date the 13th October, 1868, in which it is stated that the Indus Valley line "is absolutely necessary as constituting what has been appropriately termed the 'missing link,' the fitting in of which alone can secure for the Scinde and Punjaub lines, already completed, the prospect of becoming ultimately remunerative, and enable them to fulfil efficiently the object for which they were formed; the navigation of the river Indus having been proved to be wholly inadequate to the object in view." The despatch concludes by observing that "if the concession of a guarantee is sanctioned, it should be given to the Scinde Railway Company, and the construction be entrusted to one chief engineer, subordinate either to the Government of Bombay or to the government of this Province, as the Supreme Government may be pleased to decide, but hereafter, to save the unnecessary expense of a double agency, the entire system of the Scinde Railway Company from Kurrachee to Delhi, 1,129 miles long, should be managed by an agency with its head-quarters at Lahore."

"The arrangement thus recommended by the Punjaub Government is in strict harmony with the policy adopted in regard to the proposal to amalgamate the company's several undertakings into one; and I may state that the strong encouragement which the Government has extended to that proposal

has led the shareholders to believe that they would receive authority to construct the Indus Valley Railway to connect the upper and lower portions of their line so soon as the Secretary of State should be of opinion that the proper time for the commencement of active operations had arrived. The Board are aware that a proposal has been made for the construction of some of the future extensions of the Indian railway system by the direct agency of government, but they trust that the case of the Indus Valley Railway will not be considered one to which such an arrangement could with propriety be applied. The Directors submit that under any circumstances the employment of any agency, other than the company's own, to connect the sections of the company's line already constructed, would injuriously affect the interests of the shareholders, and would otherwise entail considerable public inconvenience, but the inexpediency of such a course becomes still more apparent when regarded in connection with the proposal to merge the several undertakings in one, as all the arguments which have been so strongly urged both by government authorities and by the directors in favour of an amalgamation, are equally conclusive against the propriety of establishing an entirely separate agency in the very centre of the company's system. There

is reason to believe, however, that a scheme for the irrigation of Scinde is being considered by the government in connection with the construction of the lower portion of the Indus Valley Railway. If this be the case there may be, *prima facie*, a reason for delaying a decision as to the lower half of the undertaking, between Kotree and Sukkur, or for adopting, in the case of that part of the line, a principle different from that which would otherwise commend itself. But it does not appear to the Board that the consideration of that question affects in any degree the upper half of the line, between Mooltan and Roree, or that it need involve any delay in proceeding with that portion of the undertaking. If the upper half of the line were constructed the worst part of the navigation of the Indus would be avoided, as well as the necessity of making the passage of the rapids at Sukkur; and the efficiency of the company's flotilla would thus be more than doubled; while the time when the Scinde and Punjaub lines will be sufficiently remunerative to relieve the State of further payments of guaranteed interest would be immeasurably hastened.

“ I am, Sir,

“ Your obedient Servant,

(Signed)

“ W. P. ANDREW,

“ *Chairman.*”

“INDIA OFFICE, S.W.,
“29th July, 1869.

“SIR,

“I am directed by the Duke of Argyll to acknowledge receipt of your letter of the 8th inst., No. 3312, urging the claims of the Scinde Railway Company to the construction of a railway up the valley of the Indus.

“In reply I am to acquaint you that it has been decided by his Grace in Council, on political grounds, as well as on those of general expediency, that the line from Mooltan to Roree, the only portion of the railway now under consideration, and which will pass to a considerable extent through native territory shall be, when sanctioned, constructed by Government.

“The cost of the Surveys in the Indus Valley, made by the Scinde Railway Company, with the sanction of Government, will be repaid to the Company on delivery of the plans, reports, field books, &c.

“I am to add that the opinion of Government in favour of amalgamating the various undertakings

of the Scinde Railway Company was formed irrespectively of the question of the agency to be employed in the construction of the Indus Valley Railway.

“ I am, &c., &c.,

(Signed) “ J. COSMO MELVILL.

“ W. P. ANDREW, ESQ.”

The Company would not have raised any further serious objections to the line being carried out by the Government had there been reasonable expectation that the works would have been prosecuted with ordinary vigour and commercial aptitude. But with the scheme of constructing the line through State Agency (after a delay of six years from the date of the Survey by the Company being sanctioned) came the proposition to occupy twenty years in completing the works, and this was followed by the further astounding proposal to introduce the break of *gauge into the centre of the main system*—measures fatal alike to the interests of the Company, and still more to those of the Indian Empire.

Setting aside, therefore, the question of the agency by which the Indus Valley line and the extension to Peshawur is to be constructed, the

vital question, in the interests of all, is the maintenance of the standard gauge, and the speedy completion of the works, the importance of this measure outweighing every private interest.

Many years have been lost in preliminaries connected with these lines, and hundreds of thousands of pounds have been wasted in the maintenance of a comparatively unemployed staff and establishment whilst discussion has been going on ; and it is therefore hoped that the Government will now adopt the most energetic measures for completing, on the standard gauge, these all-important links in the Grand Trunk system of India.

APPENDIX A.

Scheme of the Amalgamation of the several undertakings of the Scinde Railway Company as presented to the Proprietors.

“In an earlier stage of the Company’s existence, the Directors recommended that the several sections of the general undertaking should be kept separate and distinct.

“Having regard to the fact that the Company’s first operations were commenced in territories recently acquired, that the capabilities of the harbour of Kurrachee had not been fully tested, and that the different sections of the Company’s undertaking were not subject to the supervision of the same Local Government, while their physical separation from each other rendered it necessary that they should be controlled by separate agencies, it appeared to be advisable, so long as any reasonable doubt as to the success of individual sections of the undertaking might be supposed to exist, that the interests of the Proprietors of each section should be kept distinct.

“Circumstances, however, have now altered to such an extent as to render a different course advisable.

“Notwithstanding the isolated and fragmentary condition of the several sections of the Company’s system, their success has been so far assured that, with the excep-

tion of the Delhi Railway, of which only a small portion has yet been opened, they have more than paid their working expenses. The capabilities of the harbour of Kurrachee may be regarded as fully established, the area of the harbour having been virtually trebled by the improvements now in progress; and the Directors consider that the time has now arrived when the requisite steps should be taken with a view to the completion of the railway system in the hands of this Company, by the construction of the missing link between Kotree and Mooltan.

“With the early prospect of the several links in the chain of communication between Kurrachee and Delhi being united in one continuous line of railway, it appears to the Directors that the interests of the Proprietors would be materially promoted by an amalgamation of the several sections.

“The Secretary of State for India in Council, in the month of September last, signified his approval of the measure now proposed to be carried out, intimating his concurrence in the opinion that ‘an amalgamation would conduce to economy and efficiency.’

“Individual Proprietors may entertain a preference for special sections of the general undertaking, but the Directors do not hesitate to affirm their belief that, while the development of traffic over the Company’s system continues to be prejudicially affected, as at present, by the unavoidable delays and difficulties incidental to the navigation of the Indus, no individual section of the railway can ever attain so large a measure of success as would fall to its share as a component part of the completed undertaking.

“The importance of the Indus Valley line to the other sections of the Company’s undertaking has long been fully recognised by the Proprietors, who themselves passed the following Resolution on the subject at a General Meeting of the Company, held on the 28th March, 1866 :—

‘That the construction of the Indus Valley line, and the completion of the steam arch from Calcutta to Kurrachee are of the highest importance to this Company, and essential to the general interests of England and India.

‘That it is desirable that the Secretary of State for India, Earl de Grey and Ripon, should be moved by the Directors in regard to the importance of prompt steps being taken to realize these objects.’

“The Directors are convinced that it is only by carrying out the views thus urged by the Proprietors as to supplying the connecting link necessary to complete the trunk line of railway from Kurrachee to Delhi, that they can ensure a rapid development of traffic throughout the line ; and it is with this view that they now invite the co-operation of the Proprietors, being assured that by acting in accordance with the wishes of the Government in regard to the amalgamation they will not only hasten the construction of one of the most important and most urgently required railways in India, but place this Company in the best position for obtaining the concession of a line—essential to the success of the system already entrusted to them.”

APPENDIX B.

Papers relating to the Harbour of Kurrachee.

No. 1119 of 1873.

MARINE DEPARTMENT.

From COLONEL SIR W. L. MEREWETHER, K.C.S.I. & C.B.,
Commissioner in Scinde, to His Excellency the Honor-
able SIR PHILIP EDMOND WODEHOUSE, K.C.B., Governor
and President in Council, Bombay.

COMMISSIONER'S OFFICE,

Kurrachee, 15th Sept., 1873.

HONORABLE SIR,

I have the honour to forward herewith copy of a letter from Lieutenant Parker, Acting-Master Attendant, with revised directions, printed for entering the Harbour of Kurrachee. I would beg that copies of these directions may be forwarded to H.M.'s Secretary of State, with a view to their being supplied to Lloyd's, and being given the widest circulation at home possible. I would also ask that they may be communicated to the Government of India, published in the *Bombay Government Gazette*, and placed at the disposal of the Press, so that the increased facilities for entering this Port may be equally well known in India, and the Eastern Seas.

2. I would especially draw your Excellency's attention to paragraphs 3, 4, 5, 6, and 7, of Lieut. Parker's letter, from which it will be seen that vessels of the largest class may now enter and leave the Port with perfect ease and safety during the fair season. The directions show that vessels not exceeding 21 feet of draught can enter or leave the Port without difficulty or delay during all seasons of the year. And during the fair season, from October to 15th of May, vessels of the largest class with draught of 24 feet can do the same. If, therefore, it is at any time desired to embark or disembark Troops at Kurrachee for England, Scinde, the Punjaub, or North-West Provinces, no reason any longer exists why H.M.'s Troop-ships should not visit this Port, and so save the double shipment, which has hitherto been the objection to this line being adopted.

3. It will be necessary to moor vessels of any great length, stem, and stern, to prevent touching the banks in swinging,* and I have the honour to request that Lieutenant Parker's proposal to procure four screw moorings from England, and lay them down without delay, may be sanctioned. As these moorings will be chiefly used by Government vessels, I think it only reasonable that the charge may be an Imperial one. For private vessels of large size, a scale of mooring fees might be prepared, if it is considered advisable, and the proceeds credited to the Imperial Government. But as this is now becoming in a measure a new port, and it is very desirable to promote increase of trade to it, the Government of India might, perhaps, be disposed to forego this return.

* At low water springs.

4. I may here mention, that the S. S. *Atalanta*, 360 ft. long, 1,478 tons burthen,* and drawing 19·6 ft. of water in ballast, and 23·6 when loaded, was signalled off the Port early this morning, steamed straight in, and was berthed within two hours from the time she was signalled.†

5. I would beg again to most earnestly urge the question of a better Light for this Harbour. Lieutenant Parker pronounces the present one as utterly worn out and useless, and I have myself several times had practical experience of the difficulties of finding the Light while approaching the Port, on occasions when it has been the least hazy,—and during the past five years that I have been here repeated complaints have been made to me by Captains of vessels coming to the Port on the same subject. I would heartily support Lieut. Parker's recommendation, that the Light proposed by Mr. W. Price, C.E., Superintendent of the Harbour Works, should be set up. The Kurrachee Light is registered as an Imperial one, and I would trust that this measure, so important to the interests of Government, the Port, and to the safety of vessels approaching it, may now meet with favourable consideration by the Government of India. The designs are again submitted herewith.

I have the honour to be,

Honourable Sir,

Your most obedient Servant,

W. L. MEREWETHER, Colonel,

Commissioner in Scinde.

* Registered tonnage, but carries about 3,000 tons.

† The *Atalanta* loaded and left Port on 26th September, drawing 23¼ ft.

No. 435 of 1873.

From the Acting-Master Attendant, Kurrachee, to the
Commissioner in Scinde, Kurrachee.

MASTER ATTENDANT'S OFFICE,
Manora, 23rd August, 1873.

SIR,

The Harbour Works now being near completion, and the improvement to the Port, both as regards deepening the entrance channel and enlarging interior accommodation for shipping, having proved so eminently successful,

2. I have the honour to submit, for your approval, amended directions for the Harbour, more in keeping with the improved state of affairs than the directions now in use, and beg to request, if you approve of them, that you will have the goodness to give publication to the same.

3. I have myself surveyed the channel over the Bar, and find that the narrow channel, with 20 feet at low water ordinary spring-tides, gained last season, has been well maintained, and that the shelter derived from the Break-water is complete.

4. I have therefore considerably increased the draught to which Vessels were formerly allowed to load.

5. There will be no difficulty whatever for the largest class of ships to enter and leave the Harbour ; but arrangements will have to be made for berthing them, and one or two fixed moorings for large Vessels will be required, as there is hardly space for a long Vessel to swing without danger of touching the ground, at low water spring tides, on either side of the bank.

6. I would, therefore, suggest that Screw Moorings be used, so as to moor the Vessels head and stern, and would beg to recommend that 4 Screw Moorings, complete, be ordered out from England for this purpose : they could be fixed by the Superintendent of Harbour Works, who has already taken borings of the bed of the Harbour, and has reported the ground highly favourable for Screw Moorings ; moreover, Screw Moorings are much cheaper than the Anchor Moorings in use.

7. These Moorings would be available for H. M.'s Ships of War and Troop Ships, and might, I submit, be charged to Imperial Revenue, in the same manner as the Screw Moorings were supplied to the Port of Calcutta.

8. You will observe from the directions that I have offered every facility for Mail Steamers to enter the Harbour during the night : there appears to me no reason whatever why they should not come into Port at any time, day or night. I will direct the Pilots where to anchor these Vessels, so as to be as convenient as possible for the Passengers' landing.

9. In conclusion, I would beg to bring to your notice, the very inefficient state of the Light apparatus at the Manora Light House. It is quite worn out from long use, the burners are out of order, the adjusting screws are nearly useless, and the reflectors fail to answer the purpose required, the whole apparatus is beyond repair.

10. And, as Government have declined to sanction a second class Dioptric Light for this Harbour, I would suggest that a fourth class Dioptric be substituted for the present one.

11. But, I would submit, that the importance of Kur-

rachee as a Port, its trade, both present and prospective, fully justifies a good Light being provided.

12. Several complaints have lately been made by Masters of Ships visiting the Port, of inefficiency of the present Light.

13. During the thick and hazy weather; it can hardly be seen at a distance of 7 miles. It would, indeed, be deplorable, should any wreck take place near Kurrachee owing to the Light not having been seen the required distance, and I therefore respectfully appeal to you, to endeavour to move Government in the matter, with a view of obtaining early sanction for a new Light, the designs for which have already been submitted by the Superintendent Harbour Works.

I have the honour to be,

SIR,

Your most obedient Servant,

GEO. C. PARKER, Lieut. I.N.

Acting-Master Attendant, Kurrachee.

